

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:
a semiconductor chip having polarities; and
a plurality of first protection diodes connected in series
5 with polarities thereof being arranged in a same direction, the
first protection diodes and the semiconductor chip being
connected in parallel with the polarities of the first
protection diodes being arranged in a same direction as an
arrangement of the polarities of the semiconductor chip.

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2. A semiconductor device according to Claim 1, further
comprising a submount, to which the semiconductor chip is joined,
to dissipate heat generated in the semiconductor chip; wherein:
the first protection diodes are formed in the submount.

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3. A semiconductor device according to Claim 2, wherein
the submount includes:

a semiconductor substrate having a first conduction type
and made of one of silicon, silicon carbide, and diamond; and
20 an epitaxial layer having the first conduction type and
formed on one surface of the semiconductor substrate, and
wherein each of the plurality of first protection diodes
includes:

a first diffusing layer having a second conduction type,
25 which is different from the first conduction type, and formed

in a vicinity of a surface of the epitaxial layer; and

a second diffusing layer having the first conduction type and formed in a vicinity of a surface of the first diffusing layer in a region spaced apart from a region having the first
5 conduction type of the epitaxial layer.

4. A semiconductor device according to Claim 3, wherein:
the first diffusing layer is provided in a plural number in the epitaxial layer while being spaced apart from one another;
10 and

the second diffusing layer is formed in the vicinity of the surface of each of the first diffusing layers.

5. A semiconductor device according to Claim 3, wherein:
15 the submount further includes a third diffusing layer having the second conduction type and forming a second protection diode together with the epitaxial layer, the third diffusing layer being formed in the vicinity of the surface of the epitaxial layer in a joined region to the semiconductor chip.

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6. A semiconductor device according to Claim 1, wherein the submount includes:

a semiconductor substrate having a first conduction type and made of one of silicon, silicon carbide, and diamond;

25 an epitaxial layer having the first conduction type and

formed on one surface of the semiconductor substrate; and

a third diffusing layer having a second conduction type, which is different from the first conduction type, and forming a second protection diode together with the epitaxial layer, the third diffusing layer being formed in a vicinity of a surface of the epitaxial layer in a joined region to the semiconductor chip.

7. A semiconductor device according to Claim 3, wherein:
10 the semiconductor chip includes an electrode on the second conduction type side; and

the submount further includes a fourth diffusing layer having the first conduction type and used for an electrical connection to the electrode, the fourth diffusing layer being
15 formed in the vicinity of the surface of the epitaxial layer and having a higher concentration of an impurity than the epitaxial layer.

8. A semiconductor device according to Claim 1, wherein
20 the semiconductor chip is a laser diode.